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CHRONICLE OF THE WORLD HEALTH ORGANIZATION

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SCHEDULE OF MEETINGS

21-26 July	**Expert Committee on Infectious Hepatitis, first session, Liège**
28 July-4 August	**Expert Committee on Venereal Infections and Treponematoses, fourth session, London**
8-13 September	**Expert Committee on Influenza, Geneva**
15-20 September	**Expert Committee on Public-Health Administration, second session, Geneva**
22-27 September	**Expert Committee on Leprosy, first session, Geneva**
22-27 September	**Expert Committee on Tuberculosis, sixth session, Geneva**
29 September-4 October	**Expert Committee on Mental Health, third session, Geneva**
4-10 October	**Expert Committee on Bilharziasis, first session, Porto Rico**

THE FIGHT AGAINST TUBERCULOSIS IN TURKEY[1]

Early in its efforts to help the nations of the world to combat tuberculosis, WHO recognized that one of the major problems was the lack in many countries of qualified personnel to develop and carry out the necessary programmes. At its fourth session, in July 1949, the Expert Committee on Tuberculosis recommended that " WHO should assist in setting up permanent centres for training basic personnel in all branches of tuberculosis work ", adding that " so far as practicable, all these specialities should be catered for in the same area, which should, therefore, possess a dispensary, a laboratory, an epidemiological division with mobile x-ray unit, and treatment facilities ".[2]

The first step in implementing this recommendation was the creation, with WHO aid, of the Istanbul Antituberculosis Training and Demonstration Centre. In the spring of 1950, a WHO advisory team went to Turkey to help organize the Centre and to begin training courses in tuberculosis control. This team had as its objectives :

(1) demonstration of modern methods of control in an area where the incidence of the disease was high;

(2) evaluation of the results achieved;

(3) training of professional and auxiliary personnel from Turkey and, in so far as possible, from other countries in the Eastern Mediterranean Region in current techniques in the prevention, case-finding, and treatment of tuberculosis;

(4) general collaboration with, and assistance to, the Government of Turkey in its efforts to combat tuberculosis, this to include (*a*) giving advice, upon request, with regard to national legislation concerning tuberculosis; (*b*) unifying the techniques adopted by the Government in fighting the disease; and (*c*) aiding in the establishment of tuberculosis dispensaries.

Lack of adequate space in the building assigned to it at first hampered the team's work; but, when the need for larger quarters was pointed out, the Government of Turkey and the Istanbul Antituberculosis League joined forces to sponsor the construction of a new five-storey building to house the Centre. This building was officially inaugurated on 17 February 1951.[3] Complete with a dark-room for the x-ray department, a dispensary, social-service department, epidemiological services, diagnostic laboratory,

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[1] Drawn from a report, *Eighteen months of antituberculosis fight in Turkey*, prepared by Dr. E. Berthet, WHO consultant at the Centre, with the collaboration of A. Mochi, C. Ashwin, and F. Cornet, other members of the advisory team. This report is bilingual (French and English) and has been published by the Antituberculosis League of Turkey.

[2] *World Hlth Org. techn. Rep. Ser.* 1950, 7, 6

[3] *Chron. World Hlth Org.* 1951, 5, 60

administrative offices, and library, the new quarters gave added impetus to the activities which had been successfully carried on, despite certain difficulties, during the nine months since the arrival of the WHO team.

Epidemiological Aspects

An estimated 40,000 persons die yearly of tuberculosis in Turkey, i.e., a mortality-rate of about 200 deaths per 100,000 inhabitants. Some idea of the significance of this figure can be gained by comparing it with the tuberculosis mortality-rate in Denmark : 13 per 100,000 inhabitants. Denmark, which now has the lowest death-rate in the world so far as this disease is concerned, had a rate comparable with that of present-day Turkey 50 years ago. This half-a-century handicap is sufficient evidence of the need for an active programme of tuberculosis control in Turkey.

The tuberculosis morbidity-rate in Turkey is somewhat difficult to determine, owing to the small number of existing dispensaries and the consequent scarcity of epidemiological studies. During the period from

FIG. 1. ISTANBUL ANTITUBERCULOSIS CENTRE — I

Dr. A. Mochi, epidemiologist at the Centre,
is shown measuring the extent of the reaction of a tuberculin-test.

1 June 1950 to 31 October 1951, surveys were undertaken at the Centre to try to evaluate the incidence of tuberculosis among different population groups—schoolchildren, university students, workers, prisoners, inhabitants of rural areas, and others. Of a total of 24,398 tuberculin-tests, 17,200 (70%) were found to be positive; negative reactors, numbering 7,198, were given BCG vaccination. The tuberculin-tests showed a particularly high percentage of positive reactions among university students : 91.2%.

Mass x-ray surveys were also conducted : 62,197 radiological examinations were made, of which 2,386 turned out to be " suspect ". The results indicated that, of every 1,000 apparently healthy persons x-rayed, 50 to 60 needed control examinations, and 20 to 25 were suffering from active or inactive tuberculosis requiring medical care.

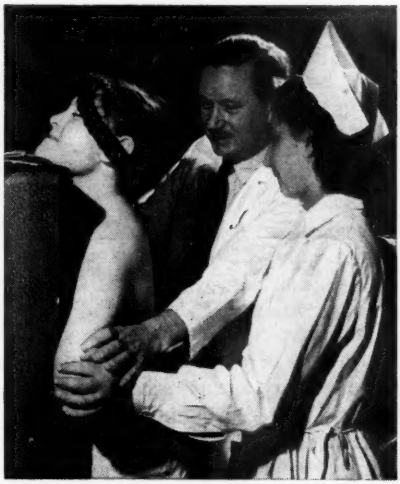
Teaching Programme

Most important of the activities of the WHO advisory team at the Istanbul Antituberculosis Training and Demonstration Centre were the training courses organized for doctors, nurses, and auxiliary personnel. In 18 months, basic instruction on medico-social problems of tuberculosis was given to 430 physicians and to 460 nurses and other medical personnel.

Four courses were organized for doctors who were granted government fellowships. Each course lasted six weeks and consisted of practical instruction, demonstrations, lectures, and seminars. Among the subjects covered by lectures—54 in each course—were : the prevention and epidemiology of tuberculosis, clinical and social aspects of the disease, diagnosis of tuberculosis, and medical and surgical treatment.

In three courses organized for nurses, emphasis was placed on the role of the nurse in the antituberculosis campaign in Turkey. Lectures covered subjects such as tuberculosis as a social problem and as a problem of the individual and of

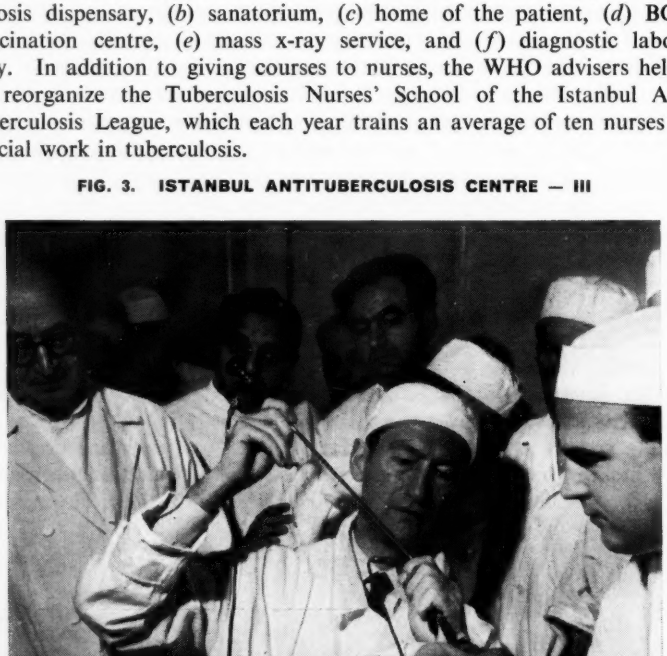
FIG. 2. ISTANBUL ANTITUBERCULOSIS CENTRE — II



Mr. C. Ashwin, x-ray technician, gives instructions on the positioning of a patient for mass x-ray diagnosis.

the family, and modern techniques in the campaign against tuberculosis. Practical exercises demonstrated the work of the nurse in the (*a*) antituberculosis dispensary, (*b*) sanatorium, (*c*) home of the patient, (*d*) BCG-vaccination centre, (*e*) mass x-ray service, and (*f*) diagnostic laboratory. In addition to giving courses to nurses, the WHO advisers helped to reorganize the Tuberculosis Nurses' School of the Istanbul Antituberculosis League, which each year trains an average of ten nurses for special work in tuberculosis.

FIG. 3. ISTANBUL ANTITUBERCULOSIS CENTRE — III



Dr. E. Husfeldt demonstrates bronchoscopy during the visit of the WHO thoracic-surgery team to Istanbul. Extreme left, Professor Fahri Arel, of Turkey ; extreme right, Dr. E. W. Andersen, anaesthesiologist with the visiting team.

Four series of seminars were conducted by the WHO team for doctors and nurses of the antituberculosis dispensaries, for those studying at the State sanitary agents' school of Istanbul (l'école des fonctionnaires sanitaires d'Etat d'Istanbul), and for Istanbul general practitioners. Efforts were made to reach the public as well, special lectures, films, and expositions being arranged for various groups. Team members also visited towns other than Istanbul to give lectures and demonstrations and to help local medical personnel in their antituberculosis activities.

In all phases of its work, the Centre tries to serve as a model and a " testing bench " for similar centres. Demonstrations of dispensary techniques, epidemiological surveys, the organization of prophylactic measures, laboratory techniques, and modern medical and surgical treatment in pulmonary tuberculosis form a major part of the operations at the Centre.

Special contributions in demonstrating modern therapeutic techniques have been made by WHO. In November and December 1950, a Danish thoracic-surgery team was sent by the Organization to Turkey. This team, under the direction of Dr. E. Husfeldt, Professor of Surgery, Department of Thoracic Surgery, University of Copenhagen, also included a cardiologist, an anaesthesiologist, and a nurse. In addition to demonstrating surgical procedures, the group gave a series of lectures and, upon its departure, left part of the surgical equipment which it had brought with it, a gift from WHO to the Ministry of Health and Social Welfare of Turkey. More recently, a French paediatrician, Dr. E. Meyer, visited Turkey, under the auspices of WHO, through the United Nations technical assistance programme, to demonstrate the use of antibiotics in the treatment of tuberculosis, particularly of streptomycin in the therapy of tuberculous meningitis.

Collaboration with the Government

Turkey is actively engaged in a fight against tuberculosis : a new law for the organization and functioning of an antituberculosis campaign has been drafted, with WHO assistance; private leagues against tuberculosis are continuing to establish dispensaries and sanatoria and to conduct x-ray surveys and programmes in health education of the public; the Ministry of Health and Social Welfare intends to create 22 new dispensaries in 1952; a large-scale BCG-vaccination campaign is to be undertaken in 1952, with UNICEF and WHO aid; sanatoria facilities are being increased (the number of beds for hospitalization of tuberculosis patients was raised from 1,023 in 1948 to 4,107 in 1951, and efforts to add to this number are continuing); and, with WHO advice, an attempt is to be made to improve and expand social-security provisions relative to tuberculous patients and their families. WHO's team at the Istanbul Antituberculosis Training and Demonstration Centre has provided new stimulus, as well as technical guidance, in this fight against a disease which takes a toll in Turkey unwarranted in view of the medico-social progress realized in its control in recent years.

SUCCESSFUL MALARIA CONTROL IN THAILAND

A WHO/UNICEF malaria-control demonstration project was initiated in August 1949 in Chiengmai, northern Thailand, under the leadership of a WHO malariologist, Dr. G. Sambasivan. His team consisted of an entomologist and auxiliary personnel, a public-health nurse, and a sanitarian. During the first year a population of about 40,000 was protected by DDT indoor residual spraying, while in 1951 the figure reached 175,000. The entomological and malariometric data collected indicate that the project has been highly successful, giving excellent results in a very short period of time. Not only has malaria transmission been interrupted, but *Anopheles minimus*, the vector species, has to a considerable extent disappeared from the area treated.

A group of seven villages in the Nong-Pong zone was sprayed in 1950 and left unsprayed in 1951, yet only one adult and one larva of *A. minimus* were caught in the entire 1951 season. At the same time, morbidity figures

FIG. 4. MALARIA CONTROL IN THAILAND

Dr. G. Sambasivan leader of the WHO/UNICEF malaria-control team in Chiengmai, instructs local workers in the preparation of DDT solution.

for the area covered dropped from 50.5 per 1,000 people in 1949 to 6.5 in 1950, and to 2.1 in 1951, while the figure is 42 per 1,000 in the control area. In the Serapee district, which was sprayed in April 1950 with the usual dosage of 200 mg per square foot, Alessandrini tests [1] made fifteen months after spraying showed a residue varying from 72–108 mg per square foot, and that mosquitos brought into contact with the sprayed surface for fifteen minutes died within five hours.

While the high vulnerability of the vector species to DDT was an important factor in the success obtained, the interest shown by the people and the enthusiastic co-operation of the young Thai malariologists, who received intensive training from the team, also played a decisive role.

The Thai Government has decided to take advantage of the experience gained in the demonstration project, and the Ministry of Health has prepared a plan for the protection of a population of 1,400,000 in 1952, increasing to 3,500,000 in 1954 and to 5,000,000 in 1956. The former WHO/UNICEF demonstration centre will be used for the field training of medical and auxiliary personnel and as an experimental centre to study the possibility of reducing the amount of insecticides and labour needed for the malaria-control campaign.

[1] *Bull. World Hlth Org.* 1950, 2, 629

MATERNAL AND CHILD HEALTH PROJECT IN PAKISTAN

As a result of a request submitted by the Government of Pakistan for assistance to the Punjab Government in carrying out its plans for expanded maternal and child health services by training community midwives, a joint WHO/UNICEF team was sent to Lahore in January 1951. In beginning its work, the team had to bear in mind that students attending its courses must be trained in maternal and child health methods consistent with the economic resources of the country and in harmony with the social and cultural background of the community; that the curative, preventive, and educational health services must be integrated; and that self-help was essential in village communities.

One of the first steps taken therefore was the establishment of a committee to advise on the project, to co-ordinate the activities of the various institutions taking part, and to give guidance to the team on the educational, economic, and cultural background of the country. In addition to the members of the team, the committee was composed of administrative officers of the Health Directorate, obstetricians and paediatricians, nursing

superintendents, and medical officers from the Punjab Health School and the Lahore Corporation. The committee's discussions covered a wide range of subjects, from the detailed problems of the project to general policies and philosophies.

One of the main questions discussed was the training curriculum for community health visitors, the name adopted in deference to local opinion instead of community midwives. It was decided to aim at having one woman health visitor for every 10,000 people as opposed to one for 150,000 as at present. Priority is to be given to training in maternal and child health care, but on the other hand the rural community's most urgent demand is for the treatment and relief of diseases and for safe delivery; therefore, if the community health visitor is to make any progress in health education, she must also be able to meet that demand. Since she evidently cannot give personal service to all the persons in her area, she must be able to teach and supervise others in certain aspects of the work; in midwifery, for instance, she will have to depend on the local dai [1] who has presided and will continue for many years to preside over deliveries in rural areas. If she is not devoting all her time to treating minor ailments, she will have to develop in parents or in one voluntary worker in each village the necessary skills to carry out such tasks as irrigation of the eyes and treatment of scabies.

Largely on account of the high cost of training, it will be necessary for many years to employ maternal and child health workers who are not trained public-health nurses and midwives. The next step, however, might be to change from the present target of one health visitor for 10,000 people to one public-health nurse and midwife for every 10,000 and one health visitor for every 5,000 people. But in order to achieve this, a drastic reorientation of nursing education is needed. The traditional nursing schools have been unsuccessful in developing the necessary initiative, self-confidence, judgement, and independence in students, and have tended to make the study of ill health precede the study of health proper. In the new curriculum adopted for the project, this somewhat illogical order has been reversed, and it is hoped that this will have a very salutary effect.

The training course is divided into four parts : preliminary training, maternal health and midwifery, public-health nursing, and paediatric nursing. The aim of the preliminary training is to provide the student with basic scientific knowledge, and to introduce her to nursing techniques before caring for patients in wards and to the social and economic factors influencing health. A preliminary training school equipped by UNICEF was opened in March 1951 in Lahore, and 75 students were admitted during the year. The school also serves as a central preliminary training school for the four large hospitals in Lahore.

[1] An indigenous midwife, with or without training

The objectives of the maternal health and midwifery course are to give the student an understanding of the significance of maternal health, and to fit her to give prenatal and postnatal care to the mother, to undertake normal deliveries both in the hospital and in the home, to carry out emergency measures, and to advise the mother on her own care and that of her child. Students do a year of domiciliary and hospital training in midwifery in one of two hospitals in Lahore after they have finished their preliminary training.

Part of the course devoted to public-health nursing is intended to give the student a basic knowledge of the social structure in which she will work and of the system of public-health organization and administration, and to provide her with the necessary knowledge and skills to give effective maternal and child health care. In all, some 50 students have taken the course, including 20 health visitors who attended a refresher course during the summer of 1951.

The course in paediatric nursing, given in the new Mool Chand Children's Hospital, lasts 8 to 10 weeks and consists of practical experience in ward duty, diet study, and the care of convalescent and chronically sick children.

The preparation of a national team to take over after the withdrawal of the WHO/UNICEF team was recognized as one of the most important parts of the project, and one or two alternates have been appointed for each of the team's members and work in the closest co-operation with them. It is thus hoped to be able to leave behind a nucleus of professional staff capable of carrying on the work begun with such success.

Reports of Expert Groups

CHOLERA

The first session of the Expert Committee on Cholera, which was held at the WHO Regional Office for South-East Asia, New Delhi, India, on 19 and 20 November 1951, continued the study of cholera problems initiated by the Joint OIHP/WHO Study-Group on Cholera. On 16 and 17 November the committee met in joint session with the Cholera Advisory Committee of the Indian Council of Medical Research (formerly the Indian Research Fund Association). The committee's report was published on 25 May 1952 as No. 52 in the *Technical Report Series*.[1]

[1] *World Hlth Org. techn. Rep. Ser.* 1952, **52**, 18 pages, price : 1/3, $0.15, Sw. fr. 0.60

Diagnosis

On the recommendation of the second session of the Joint OIHP/WHO Study-Group on Cholera, October 1948,[2] a comparative study of the results obtained in the laboratory diagnosis of cholera with Bandi's test and with classical techniques was carried out by the School of Tropical Medicine, Calcutta, India. Bandi's test as applied by Egyptian workers was found to be less reliable than cultivation on modified Wilson and Reilly and bile salt agar media. The committee therefore concludes that Bandi's test should not be recommended for use in the laboratory diagnosis of cholera. It is suggested that it would be desirable to find a method of laboratory diagnosis combining full reliability with rapidity for isolating the *Vibrio cholerae* at all stages of the infection.

At the third session of the Joint OIHP/WHO Study-Group, November 1949, a paper was presented by Krishnan & Dutta on the retrospective diagnosis of cholera through study of the agglutinin response following anticholera inoculation.[3] Further studies since that date have shown that the usefulness of such tests is limited. The committee concludes that, should work in this direction be continued, an examination should be made of the possible role of cross-reactions resulting from the presence of brucella or salmonella infection.

Characterization of V. cholerae

The complex problem of whether non-agglutinable cholera vibrios can be accepted as causal agents of cholera is fully discussed. The committee concludes that the definition of the cholera vibrio in current use, though incomplete, is sufficient for the purposes of laboratory tests. It recommends, however, the desirability of further studies on the mutation of *V. cholerae* and on the antigenic structure and virulence of vibrio strains isolated on successive days from individual cholera patients.

It is recommended that future research on the immuno-chemical properties of *V. cholerae* should emphasize studies on cholera endotoxin in relation to the antigenic components of the cholera vibrio and on the nature of the enzymic structure of various types of cholera and cholera-like vibrios.

The Central Research Institute, Kasauli, India, has expressed its willingness to make available to workers elsewhere its considerable collection of different vibrio strains. The establishment of a cholera research centre where cholera vibrio strains may be investigated by full-time workers is strongly urged.

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[2] *Off. Rec. World Hlth Org.* **19**, 25

[3] *World Hlth Org. techn. Rep. Ser.* 1950, **18**, 15; see also *Chron. World Hlth Org.* 1950, **4**, 23.

Dissemination of Infection

Data with regard to the presence and persistence of cholera vibrios in the stools of convalescents and contacts, in particular the results of a study carried out under the auspices of the Office International d'Hygiène Publique during the 1950 cholera epidemic in Calcutta, are considered by the committee, which concludes that the excretion of *V. cholerae* by convalescents and contacts is normally of short duration and intermittent. A systematic study of whether or not, and to what extent, the vibrios excreted by convalescents and carriers tend to be rough and to have an altered virulence would be desirable.

The question of the extent to which convalescent and contact carriers are disseminators of cholera infection is debated at length, attention being drawn to the observations of Nicholls [4] on carriers entering Ceylon from South India. In the opinion of most of the committee members, convalescent and contact carriers do not play a significant role; it is noted, however, that the observers of the 1947 cholera outbreak in Egypt disagree with this view.

The third session of the Joint OIHP/WHO Study-Group on Cholera had recommended that a study be undertaken on the viability of *V. cholerae* in fish and other aquatic fauna and on the dissemination of cholera through this source. A preliminary communication on the subject by Pandit & Hora was published in 1951.[5] These authors conclude that the hilsa fish (*Hilsa ilisha*) is a likely source of cholera infection, for the following reasons : the geographical location of hilsa fisheries is similar to that of the main foci of cholera endemicity in India; a correlation exists between seasonal outbreaks of cholera and the movements of the fish, and between the five-yearly peaks in hilsa fishery and the periodicity of cholera in Eastern Bengal; the normal environment of the fish is suited to cholera vibrio survival; and the methods used in handling the fish would facilitate dispersal of the vibrio. The committee is not unanimously in agreement with the authors' opinions, but the need for further study of the role of fish and other aquatic animals in the spread of cholera is recognized.

Control Measures

A report on environmental sanitation programmes in cholera-endemic areas is considered, and it is noted that a project has been proposed for the introduction of sanitary improvements and health education in an area in East Pakistan. The importance of good sanitation as an effective method of cholera prevention, and the urgent need for the initiation of sanitation programmes in both urban and rural localities, are stressed.

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[4] Nicholls, L. (1935) *Indian J. med. Res.* **22**, 713

[5] Pandit, C. G. & Hora, S. L. (1951) *Indian J. med. Sci.* **5**, 343

Statistical studies now in progress have shown that marked differences in cholera endemicity exist even between quite small adjacent districts. An exact demarcation of endemic foci would be of great assistance in the introduction of cholera-control measures.

Vaccines

On the proposal of the Expert Committee on Biological Standardization, comparative tests to determine the immunizing potency of cholera vaccine in mice are being made in order to establish international reference preparations of cholera vaccine. The Expert Committee on Cholera stresses the necessity of using a standard homogeneous strain of mice if the comparison is to be of value.

Recent experiments in animals with Sokhey's biologically standardized casein-hydrolysate vaccine [6] have shown most encouraging results. Large-scale field-studies to test the effects of the vaccine in man are recommended.

[6] Sokhey, S. S. (1950) *Bull. World Hlth Org.* 3, 33

PUBLIC-HEALTH ADMINISTRATION

The Expert Committee on Public-Health Administration was established to advise on problems involved in the development of well-organized and adequately functioning public-health administrations, a step of basic importance to health progress in all countries. The committee's first report, which deals, in particular, with the principles and practices of public-health administration and experiments in local health services, is to be published as No. 55 in the *Technical Report Series*.

Functions of Health Administrations

Expanding an early definition by Professor C.-E. A. Winslow,[1] the committee defines public health as follows :

" Public health is the science and the art of preventing disease, prolonging life, and promoting mental and physical health and efficiency through organized community efforts for the sanitation of the environment, the control of community infections, the education of the individual in principles of personal and community health, the organization of medical and nursing service for the early diagnosis and preventive treatment of disease, and the development of the social machinery which will ensure to every individual in the community a standard of living adequate for the maintenance of health, so organizing these benefits as to enable every citizen to realize his birthright of health and longevity."

[1] See Winslow, C.-E. A. (1923) *The evolution and significance of the modern public health campaign*, New Haven, Conn., p. 1.

From this definition, it may be seen that the scope of activities of a health administration is broad and varied, and should include the integration of all measures for the prevention of disease and for the care and restoration of the sick, whether carried out by official or voluntary organizations, or by both in combination.

Responsibility for health services may, however, be distributed in a variety of ways. Services which affect health directly are provided by health administrations operating either independently or jointly with other bodies; services which affect health indirectly, such as those relative to social security, are provided by other authorities. Even when the health administration is directly concerned, the degree of its autonomy within the general governmental framework may be extensive or limited ; and the sphere of its activities may include all health services or only certain aspects of them. Responsibility may be apportioned among national (federal), provincial (State), and local authorities. The national health administration may be responsible for the actual operations, it may only supervise the spending of its money, it may enforce legal sanctions without undertaking any fiscal responsibility, or it may merely promote services through education and persuasion. In Greece, for example, the national health department provides direct local service by maintaining health centres and hospitals in local areas. In Switzerland, on the other hand, the powers of the federal public-health service are limited by the Federal Constitution, and each of the 22 cantons has its own separate health machinery.

While these differences are inevitable, the scope of responsibility of the health authority must be clearly defined in each case if health programmes are to succeed. In the committee's opinion, the main functions of the central authority should be the formulation of policy, the giving of advice and specialized technical assistance to local authorities, and the enforcement of medical legislation and other standards of efficiency; the main functions of the local health administration should be operational.

A factor of great importance to the success of health programmes, and one which is insufficiently recognized, is the necessity for arousing public interest and for encouraging community participation in health measures. Health education of the public is therefore most important.

Professional and Technical Personnel

The efficiency of a health department depends to a very large extent upon its staff, especially its professional and technical personnel. In both the undergraduate and the postgraduate teaching of physicians, and of other professional groups engaged in health work, the needs of the health service should be considered, more stress being laid in the curricula on the preventive and social aspects of medicine. If physicians are to be attracted

to a health-service career in preference to a career in curative medicine, opportunities for a full-time and more interesting service, with adequate remuneration and prospects of promotion, must be provided.

The categories of personnel needed to carry out a comprehensive health programme are discussed by the committee. Most countries today do not possess key personnel—physicians, professional nurses, dentists, health engineers, pharmacists—in sufficient numbers to meet their needs. The shortage can be met to a considerable extent, however, by the provision of auxiliary personnel.

In most countries there are not enough qualified health administrators to fill the openings available. Experiments in North America in training selected university graduates as non-medical administrators have shown that such persons can relieve the medical administrator of many of his administrative duties. Auxiliary workers such as visiting nurses, medical social-workers, and almoners can similarly relieve the physician of many of his professional duties.

The training of nurse-assistants leaves registered nurses more free for supervisory and administrative work. A possible part-solution to the shortage of dentists may be found in the courses for dental nurses introduced recently in New Zealand.[2] Auxiliary sanitary staff may be trained to help the health engineer.

Other categories of personnel of value to the health programme are veterinarians, health statisticians, and technicians such as radiologists and laboratory assistants.

Experiments in Local Health Services

While it was impossible to consider a complete or even entirely representative sample of the local health services already functioning in various countries in the world, a few illustrative examples are reviewed by the committee.

America

In Brazil, the field training centre at Colatina, State of Espirito Santo, operated by the Serviço Especial de Saúde Pública, provides " an instructional public-health service unit " and " an example of a co-ordinated hospital and health service programme ". Free medical care is provided at a health centre and hospital, which since 1949 have served as a field training unit for doctors, nurses, and health engineers. At the same time, a programme of communicable-disease control and measures of improved sanitation are carried on by the staff.

[2] See Fulton, J. T. (1951) *Experiment in dental care : results of New Zealand's use of school dental nurses*, Geneva (*World Health Organization : Monograph Series*, No. 4)

An example of how special types of health services may be devised to meet particular needs is found in the " Cottage Hospital Plan ", which provides prepaid medical care and health service to the population scattered along the coastline of the Province of Newfoundland, Canada. The provincial government gives medical care and nursing and hospital services to the inhabitants of the " outports " in return for a nominal annual fee per family.

In the USA, the major part of individual health care has always been afforded by private physicians and institutions. The role of public authority, in providing both financial backing and actual facilities and services, is being gradually extended, however, in response to needs.

Asia

In India and Pakistan, health programmes have been developed as the result of the findings of a national health survey. The long-term programme, to be implemented as soon as circumstances permit, envisages the provision of adequate health-care services for every individual regardless of ability to pay. Each province is to be divided into primary, secondary, and district health units, which will serve a specific number of individuals, be staffed by a fixed minimum number of medical and non-medical personnel, and provide a specific number of hospital beds. A short-term programme, developed on the same administrative lines but less comprehensive in scope, is already being introduced.

In establishing a Health Education Service, which works in conjunction with the Rural and Urban Hygiene Service, the Ministry of Health of the United States of Indonesia has recognized the all-important principle that every health measure taken by a government should be carried through in co-operation with the people.

Europe

In Belgium, decentralized health services are, in general, organized on a provincial basis. Each province has a health inspectorate (2 in Brabant), staffed by medically qualified health inspectors and health-instructor visiting nurses; a food-supply inspectorate; a meat inspectorate; and a pharmacy inspectorate. In addition, there are sea, frontier, and airport health-services in Antwerp and Brussels.

The structure of local health administration in France is based on the administrative division of the country into departments. All health services in each department are under the direction of a medical officer, who is appointed by the Ministry of Public Health and Population and is under the administrative authority of the prefect, the governmental representative in each department. A full-time city health officer, working under the technical supervision of the departmental director of public health, is

appointed in each city of 100,000 or more inhabitants. The school health service is organized and supervised by full-time physicians appointed by the Ministry of National Education.

The principle that responsibility for health rests with the local authorities has been developed to such a degree in Norway, as an outcome of the health act of 1860, that decisions agreed upon by the local boards of health of the municipalities cannot be overruled by the central administration.

The national health service in Scotland is composed of three main branches—hospitals, general practice, and local authority services. The local health authorities are concerned mainly with the following problems: housing; environmental sanitation; industrial health; care of the aged, the partially infirm, and the bedridden; and the prevention and mitigation of prevalent diseases such as rheumatism and influenza.

By developing local health-care centres, and " homes for health ", the Yugoslav authorities have brought health care closer to the people.

Middle East

In Egypt, 200 rural centres are being planned, each to serve a population of about 20,000; each unit of 100,000 population (five centres) is to be provided with a 100-bed hospital, possessing laboratory and ambulance services.

HEALTH STATISTICS

Considered in its larger sense, the idea of morbidity encompasses all those conditions which do not conform to the definition of health expressed in the Constitution of the World Health Organization. By their wide scope and importance, morbidity statistics constitute a very valuable source of information. The various types of morbidity statistics and the uses to which they are put in different countries, together with a study of some of the general problems in connexion with health statistics, are the subject of the third report of the Expert Committee on Health Statistics, which will appear soon as No. 53 in the *Technical Report Series*.[1]

Improvement of Morbidity Statistics

The committee's report first gives a list of different types of morbidity statistics which can be collected, taking into account the varying stages of development of the countries concerned. This list indicates, in each case, the type of population covered and the purposes which the statistics

[1] *World Hlth Org. techn. Rep. Ser.* 1952, 53, 54 pages, price: 2/9, $0.35, Sw. fr. 1.40

may serve. Next, the committee presents a series of recommendations showing ways of increasing the value of statistics as a source of information on morbidity.

Many possibilities are offered by the morbidity surveys which have been, or are being, undertaken in a number of countries. They offer " a promising method for obtaining various types of health statistics, for broadening the interpretative base for morbidity data obtained by other means, and for planning health services and health programmes ". The carrying-out of these surveys calls for the collaboration of experts in sampling theory. The extent to which the survey method can be applied in a large number of countries, particularly in underdeveloped regions, should be studied.

There are often many gaps in the notification of communicable diseases, and filling in these gaps would increase the value of the relevant statistics. First, the notifications must be made more complete; second, the criteria on which they are based must be specified ; and, finally, duplication of notifications must be eliminated. The value of data on communicable diseases would be enhanced if they were published weekly.

Hospital records provide fairly accurate information with regard to diagnoses, the past medical history of patients, and the results of autopsies. It would be useful if each country should adopt a uniform system of records and classification of hospital files.

Case records of private practitioners; of social security, welfare, or educational institutions; of industrial enterprises; or of the armed forces also furnish important statistical data which should not be disregarded, although the interpretation of such records is not always easy. It is difficult, for example, to estimate the influence which factors unconnected with the disease may have on the drawing-up of medical certificates.

The advantages of the so-called " longitudinal " studies, i.e., those involving " the following of individuals or families through years of contact by physicians or by health agencies " were also considered by the committee. In its opinion, this type of study would be particularly indicated for cases of chronic diseases.

Statistical Terminology

So long as there is no uniform terminology, it will always be difficult to compare national statistics. However, before establishing a definite nomenclature, it is essential that a study be made of the terms commonly used in different countries. Such a study could be entrusted to national committees on vital and health statistics, which should be guided by certain principles. The committee requests that organizations responsible for collecting and publishing morbidity data include in their publications the definitions of terms most frequently used and indicate the limitations and deficiencies of the data.

International Statistical Classification of Diseases, Injuries, and Causes of Death

In order to facilitate the presentation of morbidity statistics, the committee recommends the preparation of either more condensed or more detailed lists, taking the Intermediate List of the International Statistical Classification as a starting-point. In addition, each country whose morbidity statistics are based on incomplete diagnoses should design " a list consisting of selected diseases, distinguished in the Intermediate List of the International Statistical Classification and recognizable in the country ".

The committee divides the various questions in the application of the International Statistical Classification into six categories :

(1) activities of the WHO Centre for problems arising in the International Classification;

(2) procedure for subsequent revisions of the International Classification;

(3) proposed adaptation of the International Classification for the use of the armed forces;

(4) code of surgical, radiological, and anaesthetic procedures;

(5) other problems;

(6) definition of blindness.

International Collaboration

The diversity of methods employed for the collection and analysis of morbidity data, and the variations in the terminology used to define the same phenomena, are obstacles to the comparability of statistics which can be overcome only by the closest possible international co-operation. National committees on vital and health statistics—whose number must be increased—are best able to ensure the continuous exchange of information among countries. The committee considers that a conference should be called in 1953 of representatives of these bodies, which are " becoming an increasingly powerful factor for the development of the fields of vital and health statistics ".

The role of WHO consists not only of encouraging countries to collect and publish morbidity statistics but also of assisting health-statistics services in the various countries by sending expert advisers, by awarding fellowships, and by organizing training courses. It is also the task of WHO to ensure, on the international level, uniformity of terminology, co-ordination of work, and exchange of information among institutions interested in statistics. WHO also collaborates with the United Nations, in particular with the Statistical Commission and with the Population Commission. Thus, the committee was called upon to study a memorandum by the Secretary-General of the United Nations entitled " Proposed standards for vital records and statistics ".

Report of the Subcommittee on the Registration of Cases of Cancer as well as their Statistical Presentation

An annex to the report of the Expert Committee on Health Statistics gives the second report of the Subcommittee on the Registration of Cases of Cancer as well as their Statistical Presentation. This is devoted to the statistical classification of neoplasms. The anatomical site, histological type, and degree of malignity are the three factors on which classification criteria must be based. At the end of the subcommittee's report there is a new proposed classification of neoplasms, according to the anatomical location of the lesion, which is more detailed than the classification found in the International Statistical Classification.

Review of WHO Publications

A HISTORIC DOCUMENT ON THE INTERNATIONAL SANITARY REGULATIONS

In April 1952 the World Health Organization published a volume entitled *International Sanitary Regulations.*[1] This volume, in addition to giving the text of the draft International Sanitary Regulations and the text of the Regulations as finally adopted by the Fourth World Health Assembly, includes a verbatim report of the proceedings of the Special Committee set up to consider the International Sanitary Regulations. It is believed that this volume of some 440 pages is of historic importance, not only to those responsible, in national and local administrations, for the application of quarantine practice, but also to medical historians.

The International Sanitary Regulations (WHO Regulations No. 2) are a revision and a consolidation of the texts of the numerous conventions and similar agreements still extant; they will enter into force for all Member States of the World Health Organization (and also for those non-Member States who so signify) on 1 October 1952, unless a reservation accepted by the Health Assembly, or a rejection, has previously been made.

Just over 100 years ago, in 1851, the rapid expansion of international trade and travel resulting from the advent of steam navigation and the great variety of quarantine practices led the French Government to convene, in Paris, the first of a long series of international conferences—conferences which had as their aim the agreement on and adoption of a uniform sanitary

[1] *Off. Rec. World Hlth Org.* 37, 443 pages, price 16/3, $2.25, Sw. fr. 9.—. Available also in a French edition.

code to govern international traffic in order to prevent the spread of pestilential disease. This first attempt in 1851 was followed by a succession of international conferences : in Paris in 1859, in Constantinople in 1866, in Vienna in 1874, in Washington in 1881, and in Rome in 1885; but it was not until 1892 that, for the first time, a convention dealing with the sanitary control of international traffic was approved by all the participating countries.

During the first half of the 20th century there were no fewer than 13 further conventions or agreements of a diplomatic character relating to health-control measures to be taken at frontiers. Unfortunately, however, none of these conventions had ever completely superseded all its predecessors. The multiplicity of the obligations undertaken by States—some being party to certain of these diplomatic instruments but not to others—has always been a cause of trouble and confusion in international traffic.

The question of the revision of the International Sanitary Conventions and their consolidation into one text applicable to all means of transport was considered in 1946 by the Technical Preparatory Committee for the International Health Conference, and the universal recognition of the need for unification of international sanitary arrangements found expression in the inclusion among the constitutional functions of the World Health Organization of that of proposing conventions and regulations and making recommendations in respect of international health matters.

In the early months of its existence, the Interim Commission of the World Health Organization established expert committees to prepare a revision of existing sanitary conventions by a study of such questions as the sanitary control of the Mecca Pilgrimage and modern advances in epidemiology and methods of disinsecting. The technical documentation thus produced was used by the Expert Committee on International Epidemiology and Quarantine in framing a set of principles to serve as a guide in the preparation of the new international sanitary regulations. After approval of these principles by the Second World Health Assembly, the expert committee, with the help of its legal subcommittee, produced preliminary draft regulations which, after further study of comments and suggestions from governments, led to the draft to which the Special Committee gave final form with a view to its adoption by the Fourth World Health Assembly. Among the main principles which have guided the authors of the Regulations must be mentioned the search for maximum security against the international spread of disease with minimum interference with world traffic. Despite the circumstances—and many pertinent examples are quoted in the verbatim records of the Special Committee—and the difficulties encountered in reaching agreement, the text was deemed to be the best possible attainable at present and was adopted unanimously on 25 May 1951 by the representatives of the 60 governments present at the Fourth World Health Assembly.

Part I of the volume comprises the debates of the Special Committee and of its Subcommittee on the Mecca Pilgrimage, together with the reports of the committee's various subcommittees and working parties. It also contains a set of resolutions on international quarantine matters adopted by the Fourth World Health Assembly on the recommendation of the Special Committee. These resolutions reflect the Health Assembly's intention of making the International Sanitary Regulations the first of a series of international regulations for the control of epidemic diseases carried by international traffic and emphasize the opinion of the experts drafting the Regulations that "a community is more effectively protected against pestilential disease by its own public-health service than by sheltering behind a barrier of quarantine measures".

Part II is devoted to the text of the International Sanitary Regulations, accompanied by an explanatory memorandum, a table of comparison with existing international sanitary conventions, and an analytical index.

GEOGRAPHICAL DISTRIBUTION OF HISTOPLASMOSIS AND HISTOPLASMIN SENSITIVITY

Histoplasmosis was first described clinically in 1906, and in 1934 *Histoplasma capsulatum*, the causative fungus, was isolated and cultivated. For many years the disease was considered to be acute, rare, and fatal. In 1945, however, it was widely observed in certain areas in a benign and asymptomatic form, rarely diagnosed. Further investigation by x-ray examinations, and by skin-tests using such fungus antigens as histoplasmin, showed a high correlation between pulmonary calcifications and histoplasmin sensitivity in tuberculin-negative persons. This observation strongly suggested that histoplasmosis produces—and in some areas is indeed the principal cause of—such calcifications.

In an article in the *Bulletin of the World Health Organization*,[1] Dr. A. Mochi and Dr. Phyllis Q. Edwards review the verified cases of histoplasmosis and the studies on histoplasmin sensitivity found in the literature up to January 1951, report on a number of hitherto unpublished investigations of histoplasmin sensitivity conducted in various countries throughout the world, and try to give as complete a picture of the geographical distribution of histoplasmosis and histoplasmin sensitivity as is possible in the light of the incomplete data now available.

The highest levels of histoplasmin sensitivity are found in the east-central part of the USA, near the junctions of the Missouri, Mississippi, and Ohio rivers, an area in which clinical cases of histoplasmosis have been

[1] *Bull. World Hlth Org.* 1952, **5**, 259 (Article in English with summary in English and French)

repeatedly observed. In Canada, histoplasmin sensitivity has been noted only in the south-eastern provinces. A somewhat lower prevalence of histoplasmin reactors than is found in the USA has been reported from certain localities in Mexico, Central America, and South America.

Studies conducted outside the Americas have revealed little histoplasmin sensitivity. Practically nothing is known concerning sensitivity in Asia, except for two investigations in India, where a negligible number of reactors to histoplasmin was found. Numerous reports covering most of the countries of Europe have failed to demonstrate any sensitivity areas, although single, isolated cases of histoplasmosis have been diagnosed in Austria, Bulgaria, England, the Netherlands, Portugal, Spain, and Turkey. Several cases have occurred in the Union of South Africa, but little is known of the rest of the African continent. Three cases have been observed in Java, but no studies of histoplasmin sensitivity have yet been reported.

Evidence suggests that large rivers flowing through regions of low altitude provide appropriate environmental conditions for the development of the fungus. However, until extensive investigations have been carried out on a worldwide scale, no realistic conclusions can be reached concerning histoplasmin sensitivity and naturally-occurring histoplasmosis. The authors emphasize the need for comprehensive studies and give specific suggestions regarding the conduct of such studies.

DIPHTHERIA IN TROPICAL REGIONS

Professor E. Grasset, Director of the Institut d'Hygiène of the University of Geneva, has made a study of the epidemiology, immunology, and prophylaxis of diphtheria in tropical regions, particularly among the indigenous populations in Africa.[1] He analyses possible explanations for the fact that morbidity- and mortality-rates from diphtheria are considerably lower in the tropics than in temperate regions.

The findings of several workers indicate an early and progressive development of a latent antidiphtheria immunity among tropical peoples. This high degree of antidiphtheria immunity, which establishes itself shortly after birth under cover of a passive immunity of maternal origin, seems to be attributable largely to social conditions and to an environment favouring early and frequent contact with the diphtheria bacillus, this contact being intensified by the prevalence of diphtheria carriers in native communities.

Such epidemiological conditions do not appear to be necessarily associated with direct contact, or even with the presence of man. Diphtheria

[1] *Bull. World Hlth Org.* 1952, 5, 321 (Article in French with summary in English and French)

antitoxin has been found not only in domestic animals, but also in the blood of various wild animals living far from man.

When the indigenous populations in tropical zones are attacked by diphtheria, the disease is usually in a primitive or atypical form. However, if their immunity fades, as it is liable to do under adverse conditions such as famine and avitaminosis, diphtheria epidemics with typical clinical characteristics and a relatively high mortality may occur. Europeans who contract diphtheria in tropical regions manifest clinically a form of the disease comparable in gravity with that in temperate regions. From a prophylactic point of view, this means that antidiphtheria vaccination should be given to Europeans living in contact with indigenous populations in the tropics even if the people themselves, because of their latent immunity, do not require vaccination.

PROBLEMS OF ANTIVENIN STANDARDIZATION

A study of the neutralization of two types of snake venom is the subject of an article by Dr. W. H. A. Schöttler, of the Instituto Butantan, São Paulo, Brazil, in a recent number of the *Bulletin of the World Health Organization*.[1] Several thousand experiments were carried out, chiefly on mice, on the neutralization of *Bothrops jararaca* and *Crotalus terrificus terrificus* by various concentrations of a polyvalent antibothropic and of a subspecies-specific anticrotalic serum, respectively.

In both in-vitro experiments (contact between venom and antivenin before intravenous injection of the mixture) and in therapeutic tests (separate subcutaneous injections of venom and antivenin), the neutralization of venom by increasing antivenin concentrations did not occur in multiple proportions. Relatively less venom was neutralized by higher antivenin concentrations. There was an end-point in the inactivation of the *Bothrops* venom beyond which further increase in antibody concentration was useless, owing to the presence in the venom of a toxic component which is not neutralized by the antivenin. The therapeutic test gave higher titres than the in-vitro assay in the case of the bothropic antivenin, whereas with the crotalic antiserum the situation was reversed. Different titres were obtained in the titration of the same antivenin with venom samples of different toxicity.

The lack of multiple proportions in venom neutralization by antiserum makes direct antivenin titration impossible and leaves the indirect assay by comparison of the unknown with a standard serum as the method of choice. An international standard of each antivenin type is proposed,

[1] *Bull. World Hlth Org.* 1952, 5, 293 (Article in English with summary in English and French)

to be specified as an antivenin which, in a volume of 10 ml or 50 ml—whichever is the more potent—neutralizes, respectively, the average, or the maximum, venom dose ejectable by the snake species under consideration. This test should be performed as a curative experiment on larger animals injected with the amount of venom which corresponds to the injection from an actual snake-bite. Further titrations of the unknown against the established standard sera can be carried out by mouse tests. The test venoms should be selected according to the highest toxicity available in sufficient quantity.

BCG-VACCINE STUDIES

In the fall of 1949, the Joint Enterprise, the Statens Seruminstitut, Copenhagen, and the WHO Tuberculosis Research Office undertook a series of field and laboratory studies on BCG vaccine. The results of some of these investigations are now being published in the *Bulletin of the World Health Organization.*

The third of the articles in this series is a preliminary report, by Dr. Lydia B. Edwards and Dr. K. Tolderlund,[1] on the effects of sunlight on BCG vaccine. Samples from the same batch of vaccine were exposed to sunlight for 0, 1, 4, 12, and 23 hours and were then used to vaccinate schoolchildren who had not reacted to the Mantoux test with 0.0002 mg of purified protein derivative (PPD). After nine weeks the children were retested, using the same dosage and batch of tuberculin, and the vaccination lesions were examined.

The mean size of the tuberculin reactions after inoculation with the vaccine which had been exposed to sunlight for one hour was 9.6 mm, as compared with 19.5 mm with the control vaccine; inoculations with vaccine exposed for longer periods showed a further reduction in the size of the reactions.

Colony counts made at the time of using the vaccine revealed that the number of colonies per ml was reduced from 9,620,000 to 8,740 after one hour's exposure to sunlight and that no growth from undiluted vaccine occurred after exposure for either 12 or 23 hours.

In another study, by Dr. Edwards and Dr. Inger Dragsted,[2] the results of exposing BCG vaccine to light in Egypt are reported. Ampoules from the same batch of vaccine were subjected to outdoor daylight (sheltered from sun), indoor daylight, and direct sunlight for periods varying from

[1] *Bull. World Hlth Org.* 1952, 5, 245 (Article in English with summary in English and French)
[2] *Bull. World Hlth Org.* 1952, 5, 333 (Article in English with summary in English and French)

30 minutes to 4 hours. The vaccine was then sent to Copenhagen, where it was submitted to comparative tests against the same lot of vaccine which had been stored at 2°-4°C at the Statens Seruminstitut. These tests included colony counts of the viable organisms and observation of the size of the vaccination lesions and of the post-vaccination tuberculin reactions in comparable groups of children. Another batch of vaccine was exposed, in Copenhagen, to daylight and to direct sunlight for periods of 15 minutes to 4 hours, and 5 to 60 minutes, respectively, following which counts of viable bacillary units were made.

The results, in addition to confirming that exposure to sunlight for short periods produces an enormous decrease in the allergy-producing capacity of the vaccine, in the size of the vaccination lesions, and in the colony counts, showed that the ultimate effect of daylight was almost as marked as that of direct sunlight, though slightly longer periods were required to produce the same results. Four hours' exposure to daylight had almost the same effect on post-vaccination allergy and vaccination lesions as exposure to direct sunlight for 30 minutes. The effect of indoor daylight was comparatively slight.

It is thought that this marked effect of daylight and sunlight on BCG vaccine may perhaps explain the variable results of vaccination which have been obtained in the past.

Reports from WHO Fellows

Many of the letters and reports received from WHO Fellows are of such interest that they deserve to be read by a wider public. They demonstrate more vividly than a series of facts and figures both the character of the fellowship programme and the response of the Fellows themselves. Selections from these reports are therefore published from time to time, but it must be emphasized that the opinions expressed are those of the Fellows.

Audiology and the Rehabilitation of Deaf-and-Dumb Children

Dr. Roger Maspétiol, laryngologist of the Hôpitaux de Paris, was granted a one-month WHO fellowship to study audiology and the rehabilitation of deaf-and-dumb children in the USA. Notes on Dr. Maspétiol's observations follow.

Dr. Maspétiol was particularly interested in preschool training of deaf-and-dumb children and in the use of hearing-aids. He visited centres for the training of the deaf in Baltimore, Md., St. Louis, Mo., and Cleveland and Northampton, Ohio.

Hearing-aids

While in France it is commonly believed that hearing-aids cannot be entrusted to infants, in the USA, Dr. Maspétiol found, children of about 3 years of age use such prostheses without difficulty. The appliances are carefully chosen and fitted, and instructions in their use are given by qualified persons. A re-selection of the hearing-aid is made after the child has had a few years of rehabilitation and has acquired some ability to speak. About 75% of deaf children have sufficient auditory power to be able to make good use of a hearing-aid; even the totally deaf are fitted with hearing-aids in some institutions, it being felt that it is difficult to judge exactly the traces of auditory sense which a child may have and that every possible advantage should be given to him.

Rehabilitation of the deaf child

Up to the age of 3½ to 4 years, the child's training must be given in the home. A hearing-aid is prescribed and the child taught to use it. Instructions are given to the mother, who is usually the person responsible for the first years of training.

Ideally, the next step is for the child to go to a kindergarten for deaf children, where, with the aid of individual or group hearing-aids, rehabilitation is continued and intensified. The mother attends certain of the classes so that she can help the child at home. Where kindergarten facilities are not accessible, all the training devolves upon the mother, who should have periodic assistance from a special instructor.

At the age of 6, the child enters a school for the deaf, where group hearing-aids, with amplifying systems, are usually employed.

Partially deaf children of normal intelligence may, by the age of 7, 8, or 9, be able to attend an ordinary school and participate in the school life of normal children. Their regular classes are often supplemented by lessons in speech-improvement. While these children may be one or two years behind normal children of their age so far as studies are concerned, their early training and consequent ability to speak and to understand what is said makes their handicap unapparent. In at least one instance, Dr. Maspétiol was unable to distinguish the deaf children from their normal classmates.

In schools for the totally deaf, sound amplifiers are generally used, as an aid both to comprehension and to learning to speak. Lip-reading is an essential part of the training of the totally deaf. These children are directed towards manual work, although in some cases they may be able to enter ordinary schools and take a normal course of studies.

Dr. Maspétiol stresses the fact that the remarkable results achieved in the USA in the rehabilitation of the deaf depend upon (1) early training, beginning at the age of 2 to 3 years at the latest, and (2) the utilization of whatever auditory sense the child may have by means of a hearing-aid.